

What is claimed is:

- 5 (1) A method of treating a subject afflicted with sickle cell disease which comprises administering to the subject an amount of an antiviral agent effective to inhibit sickling of a cell in the subject, so as to thereby treat the subject afflicted with sickle cell disease.
- 10 (2) A method of inhibiting polymerization of hemoglobin which comprises contacting the hemoglobin with an amount of an antiviral agent effective to inhibit polymerization of the hemoglobin, so as to thereby inhibit polymerization of the hemoglobin.
- 15 3. The method of claim 2, wherein the hemoglobin is present in a cell and the contacting is effected by contacting the cell with the antiviral agent.
- 20 (4) A method of inhibiting sickling of a cell which comprises contacting the cell with an amount of an antiviral agent effective to inhibit polymerization of hemoglobin in the cell, so as to thereby inhibit sickling of the cell.
- 25 (5) A method of determining whether an antiviral agent is capable of treating a subject afflicted with sickle cell disease which comprises:
- 30 (a) obtaining a suitable sample of cells from a subject afflicted with sickle cell disease;
- (b) subjecting the sample to conditions such that the cells in the sample sickle; and
- 35 (c) comparing the amount of sickling of the cells in the presence of the antiviral agent with the amount of sickling of the cells in the absence of the antiviral agent,
- wherein an absence of sickling or a reduction in the

amount of sickling in the cells in the presence of the antiviral agent compared with the amount of sickling of the cells in the absence of the antiviral agent indicates that the antiviral agent is capable of treating a subject afflicted with sickle cell disease.

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(6)

A method of determining whether an antiviral agent is capable of inhibiting sickling of a cell which comprises:

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- (a) obtaining a suitable sample of cells from a subject afflicted with sickle cell disease;
- (b) subjecting the sample to conditions such that the cells in the sample sickle; and
- (c) comparing the amount of sickling of the cells in the presence of the antiviral agent with the amount of sickling of the cells in the absence of the antiviral agent,

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wherein an absence of sickling or a reduction in the amount of sickling in the cells in the presence of the antiviral agent compared with the amount of sickling of the cells in the absence of the antiviral agent indicates that the antiviral agent is capable of inhibiting sickling of the cell.

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(7)

A method of determining whether an antiviral agent is capable of inhibiting polymerization of hemoglobin which comprises:

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- (a) obtaining a suitable sample of hemoglobin from a subject afflicted with sickle cell disease;
- (b) subjecting the sample to conditions such that the hemoglobin polymerizes; and
- (c) comparing the amount of turbidity of the sample in the presence of the antiviral agent with the amount of turbidity of the sample in the absence of the antiviral agent,

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wherein an absence or reduction in the amount of

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turbidity in the sample in the presence of the antiviral agent compared with the amount of turbidity in the sample in the absence of the antiviral agent indicates that the antiviral agent is capable of inhibiting polymerization of hemoglobin.

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8. The method of any one of claims 2, 3, 4 and 7, wherein the hemoglobin is Hemoglobin S.

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9. The method of any one of claims 2, 3, 4 and 7, wherein the hemoglobin is Hemoglobin SC.

10. The method of any one of claims 1, 3, 4, 5, 6, and 7, wherein the cell is an erythrocyte cell.

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11. The method of any one of claims 5, 6, and 7, wherein the suitable sample is a sample of erythrocyte cells.

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12. The method of any one of claims 3 and 4, wherein the cell is present in a subject and the contacting is effected by administering the antiviral agent to the subject.

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13. The method of any one of claims 1-7, wherein the antiviral agent is a purine analog.

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14. The purine analog of claim 13, wherein the purine analog is a guanosine analog.

15. The guanosine analog of claim 14, wherein the guanosine analog is acyclovir

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16. The guanosine analog of claim 14, wherein the guanosine analog is valacyclovir.

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17. The method of any one of claims 1, 5, 6 and 7, wherein the sickle cell disease is selected from the group consisting of sickle cell anemia, sickle β -thalassemia, sickle cell-hemoglobin C disease and any other sickle hemoglobinopathy in which hemoglobin S interacts with a hemoglobin other than hemoglobin S.

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18. The method of any one of claims 1, 5, 6, 7 and 12, wherein the subject is a mouse, rat, dog, guinea pig, ferret, rabbit, primate, or human being.

19. The method of any one of claims 1, 5, 6, 7 and 12, wherein the antiviral agent is administered to a subject via intralesional, intramuscular, subcutaneous, intravenous, intraperitoneal, liposome mediated, transmucosal, intestinal, topical, nasal, oral, anal, ocular or otic delivery.

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